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The PUT-and-CALL

LEONARD R. HIGGINS

EFFINGHAM WILSON

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THE PUT-AND-CALL

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THE PUT-AND-CALL

BY
LEONARD R. HIGGINS

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1896

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TO MY ESTEEMED FRIEND,

MR. E. HEDLEY CUTHBERTSON,

THIS LITTLE VOLUME IS

Respectfully Dedicated.

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PREFACE.

THE writer of the following pages feels that, in publishing this little book on Options, he may be telling many of his professional friends what they already know perhaps better than the author. If, however, he succeeds in supplying in a readable form an answer to the question which has so often been put to him by the uninitiated, *viz.*, "What is an Option?" and in placing before those who have mastered the intricacies of Option dealing the Theory of the "Value of the Put-and-Call" in a somewhat new light, the object of his little book will be attained.

June, 1896.

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CHAPTER I.

INTRODUCTION.

THE Committee of the London Stock Exchange recognise the legality of optional dealings in stocks and shares provided that the option period does not exceed two accounts beyond that for which bargains are being currently made; but they will not legislate upon any dispute arising from an option transaction done for a longer period, nor can a claim be made against a defaulter's estate in respect of any such unrecognised bargain. Rule 90, applicable to registered stocks, says: "The committee will not recognise any bargain in shares or stocks effected for a period *beyond the ensuing two accounts*"; and Rule 112 relating to securities to bearer is to the same effect.*

In spite of these disadvantages, however, options for two or three months, and even further ahead, are

* It must be stated, however, that the above-mentioned rules do not apply to English, India, Corporation and Colonial Government Inscribed Stocks, for under this heading Rule 79 reads: "The committee will not recognise any bargain for a future account if it shall have been effected *more than eight days previous to the close of the pending account*".

easily negotiated in the London market; in fact, the "option period" may be said to range from a few hours to six months. Day-to-day options are not so largely dealt in as they were in former years, many of the persistent takers of "day-to-day money" having found that the risks involved were not sufficiently covered by the small amount of "money" given, and that the practice had a tendency to encourage the running of a large, unprofitable "book".

The "call o' more to-morrow" and "put o' more to-morrow" still survive; for, on the one hand, such transactions are frequently found by parties interested in engineering a rise or a fall to be useful in puffing or depressing the stock which is the object of their attention, and, on the other hand, provide a more profitable method of taking option money, as the real amount of premium involved in a "call o' more" transaction is greater than would appear at first sight from the difference between the market price and the option price of the stock.

"Puts" and "calls" of stocks are commonly done for one week and for one account, but the majority of the options negotiated in the London market are for one month, two months, and three months on.

It may be of interest to mention that dealings in the London Stock Exchange are settled twice every month, the dates of the settlements (which are fixed by the committee three accounts in advance) falling about the middle and end of each month. The length of the account ranges from thirteen to nineteen days

and the settlement occupies three days, called respectively, "contango day," "ticket day," and "settling" or "account day".

On the contango day all stocks not being paid for or delivered are "carried over" to the following account at a "making-up" price, which is fixed by the official broker or by the market, those persons who are unable or unwilling to pay for stock bought giving a market rate of interest to those who have money to lend. It sometimes happens that dealers or speculators, who have sold more stock than they can conveniently deliver, have to pay a fine for non-delivery to those who have bought it. The postponement of delivery is arranged on the contango day, and the fine imposed is called a "backwardation" or "back".

On the second day of the settlement or "Ticket day" the names and addresses of the persons for whom brokers have bought registered stock are given to the sellers on what is called a ticket. This ticket also bears the name of the member paying for the stock and the price at which the transaction is done, or at which the transfer is to be made out, and it is passed from hand to hand until it reaches the ultimate seller, who saves the intermediate dealers the trouble of handling the stock by delivering both stock and ticket to the original issuer of the latter.

On the third day (the settling day or account day) all stock passes and is paid for, and "differences" upon the accounts are settled by means of cheques drawn on "clearing" bankers.

Consols have a settlement for themselves at or near the commencement of each month.

Day-to-day options are declared at 2·45 P.M., while those done for the current account or for a future account are declared at 12·45 P.M. on the contango day (called also the first making-up day).*

Options for future accounts are done, unless otherwise stipulated, at the price of the stock for the account in question, *viz.*, the present market price, *plus* "contangos" or *minus* "backwardations". Thus, if a stock stands at 50, and the estimated rate of interest in contango upon that stock is 4%, we must add on $\frac{3}{24}$ of 4%, if dealing for three accounts ahead, bringing the price up to, say, $50\frac{1}{4}$, or $\frac{6}{24}$ of 4%, for six accounts ahead, bringing it up to, say, $50\frac{1}{2}$, and so on.

In the case of a "back," the estimated amount of backwardation for the future period would be deducted from the present price when fixing the option price for that period.

Apart from the question of rates, options are frequently done at prices considerably above or below the actual prices† for the period in question, and in the examples given of these "fancy" Options, we shall describe the difference between the market price and

* The first making-up day for mining shares falls on the day before the contango day for foreign stocks, *i.e.*, three days before the pay day.

† It is usual to speak of the ordinary market price for a forward bargain in firm stock as the "right" price for the period in question.

the price fixed as the "distance". The French term "écart" expresses the "distance" plus the amount of option money given; thus 1% given at a price which is ½% over the market price would be an écart of 1½%, of which 1% is the Option money (1½ écart, dont 1).

CHAPTER II.

DEFINITIONS.

Option. THE word "*option*," in connection with transactions in stocks and shares, means a right to buy or sell a certain quantity of stock on a given day, at a price agreed upon at the time the bargain is struck, for which right the "giver" of option money pays a consideration to the "taker"; the said option money being payable at the end of the stipulated option period.

The payment of option money may purchase the right :—

Call. *First*, to buy stock at a given price, at a specified future date, this option being known as a "call". At the end of the option period, the "giver" declares whether he will exercise his option and *call* the stock or not.*

Put. *Secondly*, to sell stock at a given price at a specified future date; the option is then called a "put". When the option expires, the "giver" tells the

* In actual practice, the formal declaration of an option only takes place when the market price at option time is so close to the agreed price of the option that the bargain does not speak for itself. When the market price of the stock is distinctly above or below, it is understood by the "taker" that the stock is bought, or sold, as the case may be.

"taker" whether he wishes to *put* the stock on him at the agreed price, or not.

Thirdly, to either buy or sell (whichever may suit the "giver") stock at a prescribed price at a specified future date; the name of this double option is the "put-and-call".* **Put-and-Call.**

The enjoyment of the double right costs twice as much as the single option to buy or to sell would have done. There are, however, exceptional circumstances where, through great scarcity of stock, or dearness of money, the double option, or "put-and-call," can be done more easily than the single option; in such cases the "put-and-call" money might not be quite as much as double the charge for the single option. An example of this is given in a future chapter.

The premium paid for the right of *calling* or *putting* stock at some future date, at a stipulated price, is sometimes included in the price at which a transaction is done, for the same date, in firm stock. Thus, a "giver" of option money will buy a certain amount of stock firm for delivery, *e.g.*, two months ahead, at a figure sufficiently over the current market price for that period to carry with it the option of *calling* a like amount at the same price. This transaction in options is known as buying stock "call of more". **Call o'More.**

The "put of more" is the same kind of optional transaction, in the other direction. The giver sells **Put o'More**

* In writing this term it is customary to abbreviate it into p.a.c.

stock to the taker under the market price with the privilege of being able to sell him another like quantity of the stock at the same price at the end of the option period. In these cases, the difference allowed between the market price and the price fixed upon is regulated by the market value of the option in question at the time of dealing, and is fully explained in chapter vii.

A stock may be *bought* call o' more or *bought* put o' more: in the former case the buyer is "giving option money," and in the latter he is "taking option money". In like manner if A sells to B stock call o' more, the option to *call* rests with B, and A is "taking option money". If A sells stock to B put o' more, he is giving the option money and has the right to *put* on B.

The price given for the firm stock may carry the right to buy twice, three times, or any number of times, the amount of the firm stock dealt in; the options being termed "call of twice more," "call of three times more," etc., or, in the selling direction, "put of twice more," "put of three times more," etc. Such fancy options, however, are not very frequently indulged in.

It may be worthy of remark that "calls" are more often dealt in than "puts," the reason probably being that the majority of "punters" in stocks and shares are more inclined to look at the bright side of things, and therefore more often "see" a rise than a fall in prices.

This special inclination to buy "calls" and to leave "puts" severely alone does not, however, tend to make "calls" dear and "puts" cheap, for it will be shown in a later chapter that the adroit dealer in options can convert a "put" into a "call," a "call" into a "put," a "call o' more" into a "put-and-call," in fact, any option into another, by dealing against it in the stock. We may therefore assume, with tolerable accuracy, that the call of a stock at any moment costs the same as the put of that stock, and half as much as the put-and-call; the causes referred to on page 7 being the only ones which would be likely to bring about an exception to this rule, and even then the difference would seldom be important.

CHAPTER III.

WORKING THE SINGLE OPTION.

HAVING discussed option dealing in a general sense, we will now pass on to some practical examples of "calls," "puts," and "put-and-calls," explaining how, in some cases, a favourable movement in the market price can be turned to advantage by a giver of option money, and showing the manner in which such dealings are booked. All the examples given have been based upon actual market movements, between the years 1888 and 1894, but it is of course understood that the amount of option money quoted is only approximately the market value of the option at the dates mentioned.

9th May, 1892, given $2\frac{3}{8}$% call £10,000 Brighton "A" at $152\frac{7}{8}$ for end June.
28th May, sold £5000 Brighton "A" at 157 end June.

The giver here sells half his option stock for the end of June, avoids carrying over a "bear" position for two accounts, and secures $4\frac{1}{8}$% on £5000 stock equal to $2\frac{1}{16}$% on £10,000. His position now is that whatever Brightons go to, he can only lose $\frac{5}{8}$% on £5000, or $\frac{5}{16}$% on £10,000; for if they go higher he can secure his profit on the remaining £5000; and if they fall below his option price ($152\frac{7}{8}$) he can rebuy the £5000 sold and abandon his option; the whole $\frac{5}{8}$% would be lost only

in the event of their being quoted exactly 152⅞ at the end of June, when he would call only the £5000 he has sold and lose the difference of $\frac{5}{16}$ on £10,000, or $\frac{5}{8}$ on £5000.

At the end of June, however, Brighton A are quoted 158⅜, at which price he sells the remaining £5000, and the account stands thus :—

End June, 1892, Account.

9th May.				*28th May.*	
To 2¾ call 10,000 B. A, at 152¼	£237	10	0	By 5000 B. A, at 157 (sold)	£7850 0 0
25th June.				*25th June.*	
To called 10/m B. A, 152⅞	15,287	10	0	By 5000 B. A, at 158⅜	7918 15 0
Balance	243	15	0		
	£15,768	15	0		£15,768 15 0

Balance of profit £243 15 0
= 2$\frac{7}{16}$% on £10,000.

We will now take a case which works out less favourably to the giver :—

13th August, 1892, given 3°/₀ call £4000 Brighton A at 158¼ end October.

By 3rd September the price has risen to 162, but our giver "seeing" a further rise does not sell against his option. If he sold the whole £4000 at this price he would obviously secure a profit of ¾°/₀ on the £4000, as they "stand him in" at 161¼, including option money. If he sold half (say £2000) he would secure 3¾°/₀ gross on £2000 = 1⅞°/₀ on £4000, so that his loss would be limited to 1⅛°/₀ on £4000, and he might have a profit in the event of either a further rise or a considerable fall, for if the price at end of October is below 158¼, he would repurchase the £2000 and abandon the call.

He does nothing, however, and the price goes

steadily back, until at the end of October Brighton "A's" have run down to $153\frac{1}{8}$, and his account shows only the option money to his debit:—

End October Account.

13th August, 1892.			
To 3% call £4000 B. A, at $158\frac{1}{4}$ - - - -	£120	0	0

We will now take the case of a giver for the put of Spanish 4% Bonds, who prefers covering the whole position at one price.

26th September, 1891, given $1\frac{1}{8}$% put of £5000 (£4761 10s.*) Spanish at $71\frac{3}{4}$ (cum dividend) end November.

On 1st October Spanish are quoted $70\frac{3}{8}$ "ex dividend" (the quarterly dividend of 1%). This 1% taken off the price is no source of profit to the "bear," or the buyer of the put, for it will be debited to him if he *puts* the stock, the dividend belonging to the person on whom he *puts* it. By the 24th October Spanish Bonds are quoted $65\frac{5}{8}$; still the giver will not buy against his option, although he could secure 4% net profit by so

* The nominal "one thousand Spanish 4%" is a bond of the denomination of £952 6s. This was arrived at at the time of the issue by converting the 24,000 pesetas or francs into sterling at the fixed exchange of 25·20¼, and then adjusting the amount of £ s. d. to the nearest amount which was divisible by 24, without making fractions of pence. Thus 1000 pesetas or francs Spanish 4% is £39 13s. 7d. nominal. These twenty-fourth parts are known as "halfpence of Spanish," the whole £952 6s. being called "a shilling". In the Paris market the nominal thousand Spanish is 1000 francs Rente (4% on fcs. 25,000), so that the "one" Spanish French amount is "a shilling and a halfpenny" English; ten thousand Spanish French amount is "ten and fivepence" English, and so on.

doing (*i.e.*, the difference between $65\frac{5}{8}$ and $71\frac{3}{4}$—1% div. – $1\frac{1}{8}$ option money). If he bought back half his stock at $65\frac{5}{8}$ x. d., *i.e.*, $5\frac{1}{8}$ below his option price, he would be in this position: having secured $5\frac{1}{8}$ on one half, equal to $2\frac{9}{16}$ on the whole, he would in any case make a profit of $2\frac{9}{16} - 1\frac{1}{8} = 1\frac{7}{16}$ on the £5000, and stand to make an additional profit on the other half of whatever Spanish were over or under $70\frac{3}{4}$ x. d. at the end of November But he fancies the next coupon will not be met, and is determined to run his option for all it is worth. Accordingly, on the contango day of the end of November account, he takes a profit on his put of $5\frac{1}{2}$% by buying back his £5000 Spanish at $64\frac{1}{8}$, and *putting* them at $71\frac{3}{4}$ cum div.

The option is recorded in the ledger as follows:—

26th September.				*25th November.*			
To $1\frac{1}{8}$% put £5000* (£4761 10s.)				By 5 Spanish (put) at $71\frac{3}{4}$ -	£3416	7	6
Spanish at $71\frac{3}{4}$ - - -	£53	11	4				
25th November.							
To 5 Spanish (bought $64\frac{1}{8}$) -	3053	6	3				
To 1% dividend on do. (tax not reckoned) - - - -	47	12	4				
Balance - - -	261	17	7				
	£3416	7	6		£3416	7	6
				Balance - - -	£261	17	7
				= 5½% on £4761 10s.			

Subjoined are examples of a successful call and an unsuccessful put of Rio Tinto Copper Shares, in which a very large option business has from time to time been done.

On 22nd March, 1890, when Rio Tinto Shares have been steadily recovering some of the enormous fall resulting from the collapse of the copper corner of the previous year, our operator "sees" a further advance, and—

Gives $1\frac{3}{16}$ per share call 200 Rio Tinto at $15\frac{7}{8}$ for end June Account.

The price fluctuates within narrow limits for several weeks, and by 26th April Rio Tinto are negotiable at $16\frac{1}{2}$. To sell at this price would not cover the option money risked; therefore, as the option has still two months to run, and copper is rising steadily, our giver waits off. The following two weeks witness a remarkable rise, and on

10th May he sells 50 shares at $17\frac{7}{8}$ per end June.

If he sold for the current account, he would have a "bear" position in 50 shares to carry over three accounts (mid May, end May, mid June), so he prefers to sell for the same date as that for which the option is done. This is, in most cases, the simplest and best way of dealing against a future option.

On 17th May he sells another 50 shares at $18\frac{5}{8}$ per end June.

He has now sold 100 shares at a price averaging $18\frac{1}{4}$ against his call at $15\frac{7}{8}$, and has thus secured a difference of $2\frac{3}{8}$ per share on one half of his option, equal to $1\frac{3}{16}$ upon the whole 200. But he has only risked $1\frac{3}{16}$ originally; therefore, whatever becomes of Rio Tinto, he cannot lose. Let us now examine what his position is. He has risked $1\frac{3}{16}$ in option money, to counterbalance which he has, by selling half his stock, assured himself of a margin equal to $1\frac{3}{16}$ on the entire 200 shares, and he still has 100 not realised. Whatever he can sell the remaining 100 at, *over* $15\frac{7}{8}$,

must be net profit. If Rio Tinto stand at exactly $15\frac{7}{8}$ at the end of June, he can make nothing out of the remaining 100. But if they happen to be below $15\frac{7}{8}$ he will abandon his call and purchase in the market the shares he sold at $18\frac{1}{4}$ average, in which case he will again make on 100 shares the difference between $15\frac{7}{8}$ and the price he buys them at. He practically has a call of 100 at $15\frac{7}{8}$ for nothing, and a put of 100 at $15\frac{7}{8}$ for nothing (since all below $15\frac{7}{8}$ is his profit on 100); or, to use a professional term, he has given O for the put-and-call of 100 Rio at $15\frac{7}{8}$.

The conversion of a single into a double option thus exemplified is one of the most important features in option dealing, and the principle is further explained in chapter vi.

To follow this option to its successful close we must observe that on 7th June "Rio" are quoted $22\frac{1}{8}$ (ex dividend of 10/-), and at this price the giver, having had an exceptional run for his option money, sells the remaining 100, making upon them the whole difference between $15\frac{7}{8}$ and $22\frac{1}{8}$, and taking the dividend of 10/- on 100 shares as well.

End June Account.

22nd March.				*10th May.*			
To $1\frac{3}{16}$ call 200 Rio Tinto, $15\frac{7}{8}$ (end June)	£237	10	0	By 50 Rio Tinto (sold), $17\frac{7}{8}$ -	£893	15	0
				17th May.			
				By 50 Rio Tinto (sold), $18\frac{3}{8}$ -	931	5	0
28th June.				*7th June.*			
To called 200 Rio Tinto, $15\frac{7}{8}$	3175	0	0	By 100 Rio Tinto (sold), $22\frac{1}{8}$ x.d. - - - -	2212	10	0
				By 10/- div. on 100 - -	50	0	0
Balance - - -	675	0	0				
	£4087	10	0		4087	10	0

Balance of profit - £675 0 0
= $6\frac{3}{4}$ on 100 = $3\frac{3}{8}$ on 200 shares.

A few days after the close of this successful operation Rio Tinto have advanced still further—to about 23, and thinking the price now high enough the operator turns round on the "bear tack," and on

5th July, 1890, gives $1\frac{3}{8}$ put of 100 Rio Tintos at $23\frac{1}{8}$ end August.

In the former option we saw that he was able to do a three months' call of 200 shares at $1\frac{3}{16}$ per share. The upward movement has been so rapid since then, and takers of option money have had such a bad time in Tintos, that he now has to pay considerably more for a two months' put than he had before for a call three months ahead. His view would appear to be right, when, on the 19th July, Tintos have run back to $22\frac{1}{4}$. If he now buys the 100 shares at $22\frac{5}{16}$ for end August he can save $\frac{3}{16}$ of his option money, and in the event of the price being, at the end of August,

First, below $23\frac{1}{8}$, he *puts* them and loses $1\frac{3}{8} - \frac{3}{16} = \frac{9}{16}$.

Second, exactly $23\frac{1}{8}$, he *puts* them and loses $\frac{9}{16}$.

Third, above $23\frac{1}{8}$, he abandons the put and sells his 100 shares, the difference over $23\frac{1}{8}$ going to reduce the above-mentioned loss of $\frac{9}{16}$: if he can get $\frac{9}{16}$ over $23\frac{1}{8}$, *i.e.*, $23\frac{11}{16}$, he comes out of the transaction "even," thus—

100 shares bought $22\frac{5}{16}$ } Difference $1\frac{3}{8}$, the same as
100 do. sold $23\frac{11}{16}$ } the option money risked,

and anything higher than that is his profit on 100 shares.

We saw in the last example how the operator by selling one-half of his stock against a call practically

got a put-and-call of one-half the original amount of stock. In this example we find that our giver, if he bought back all his stock against the put, would practically have a call of the same number of shares. This operation is known as turning a put into a call, and will be further analysed in a later chapter.

On 26th July the shares have risen again to $22\frac{7}{8}$, only to react by the following week to 22. Once more the giver would have a chance to save a good deal of the option money ($23\frac{1}{8} - 22 = 1\frac{1}{8}$) but he does not like to lose even the difference between $1\frac{3}{8}$ and $1\frac{1}{8}$. He therefore holds out for a further fall, which, however, does not come during the run of his option; for on the 9th August Rio Tinto are $22\frac{3}{8}$, on the 16th August $23\frac{7}{16}$, on the 23rd August $24\frac{1}{4}$, and three days later his option expires at 12·45 on the contango day, shares changing hands at $24\frac{11}{16}$. The option money is consequently a total loss.

End August, 1890, Account.

5th July.				
To $1\frac{3}{8}$ put 100 Rio Tinto, $23\frac{1}{8}$	£137	10	0	

CHAPTER IV.

WORKING THE DOUBLE OPTION.

In the preceding examples the giver of option money has been made to take a view for the rise or fall of a certain stock, and to base upon this view an operation in the single option. Now, it frequently happens that a giver, wishing to do an option, is undecided as to the direction which the next few points move will take in the stock under consideration, so he commences operations by giving for the put-and-call of the stock and waits for further developments. This, by the way, frequently turns out to be a judicious mode of procedure, especially when the object of the speculator's attention happens to be one of the American Railroad Stocks, in which the fluctuations are generally violent and uncertain. The American market has for many years offered a fair field alike for the giver and for the taker of option money, both parties to the deal in a three months' option having, as a rule, plenty of excitement for the money! Indeed, it is surprising that so many speculators in American shares should continue to deal in "firm" stock, when so much amusement can be procured at the moderate prices generally ruling for American options. A giver of option money on Americans once observed: "If only I had

given for the put as often as I have given for the call, how much money I should have made and *how little I should have risked!*" It is more than likely that if this operator had nerved himself at the time to pay twice as much for the put-and-call as he paid for the single option, he would, in the long run, have had little reason for regret.

Let us illustrate our subject by a put-and-call of Louisville and Nashville Railroad Shares.

*** 2nd January, 1892, given $5\frac{1}{8}$ per share put-and-call 200 Louisville at $86\frac{3}{8}$ end March.**

This looks a lot of money to give in a quiet market, but option takers have unpleasant recollections of rapid and unforeseen movements in the leading speculative American shares. They cannot forget the bad

* American Railroad Stocks dealt in here are in shares of $100 each (except Pennsylvania Shares and Philadelphia and Reading Shares, which are of $50 each). The nominal amount of stock, in dollars, of 100 shares is therefore $10,000, which at the nominal or fixed exchange of $5 to £1 is £2000. The price quoted in London is arrived at by converting the New York price per cent. into an English price per cent. at the exchange of the day. The English price is therefore in £ s. per cent.: thus, $97% New York at $4.85 is £100% London, so that if one bought 100 shares (= $10,000) in New York at 97 (= $9700) and sold £2000 (nominal) in London at 100 (= £2000), the proceeds of the London sale at the exchange of $4.85 would yield $9700 to pay for the purchase in New York. But it is more convenient and therefore customary to speak of 50 shares or 100 shares in the London market, and regard the price quoted as a sort of *English dollar* (4/-) *price*. The above option example is accordingly expressed, "given $5\frac{1}{8}$ put-and-call of 200 shares," but, correctly speaking, it would be £5 $\frac{1}{8}$% put-and-call of £4000 stock.

turn Louisville did them in October and November, 1890, by dropping 16 points in half as many weeks, only to catch them "out" again the following autumn, when the same shares rushed up from 68 to 81½ in less than two months.

By *16th January* Louisville are quoted 81⅛ (ex dividend $2½). In comparing the market price with the option price the giver has now always to take into consideration the dividend; if he *puts* the shares the taker will debit him with the dividend; if he *calls* them, he will receive it from the taker. In other words, he will *put* the stock if it stands below 86⅜ – 2½ = 83⅞, or *call* it if it is quoted above that figure. It is usual to say the option price is 83⅞ x.d.

The shares are now a weak market, and the giver decides to go with the tendency, and refrain from buying until his option money is covered.

23rd January, Louisville 79¼. If he bought 200 shares at this price he would make $4⅝, and lose $5⅛, *i.e.*, $½ on balance.

On 30th January they are down to 76⅝. Now is his chance.

On 30th January he buys 200 Louisville at 76⅞ per end March.

This not only covers his $5⅛ put and call money, but leaves a profit of $1⅞ per share as well, and there is the chance that he might make still more during the two months the option has yet to run. He cannot make more if the shares continue to fall—in that case he has closed his position too soon, and missed a further

chance of profit. Nor can he secure any additional advantage by an advance in price to $83\frac{7}{8}$ x.d. (his option price), unless, indeed, he has the luck to hit off a reaction in selling out again and covering with a profit; but it must not be forgotten that in selling again under the price at which he has the right to *put* he risks losing part or all of the profit he has already secured. His *only* chance of more profit without risking anything is for Louisville to rise above $83\frac{7}{8}$ in the next two months. What is his position then? We will leave out the $1\frac{7}{8}$ realised profit, and consider it put away for some future enterprise. By his purchase of 200 shares he has covered the original risk of $\$5\frac{1}{8}$, but if the price is over $83\frac{7}{8}$ at the end of March he will not *put* these 200; on the contrary, he will exercise the other part of his option, *viz.*, *call* 200 shares, and thus be in the position of having 400 shares to sell. Then his *additional* profit will be the difference on 400 shares between $83\frac{7}{8}$ and whatever they fetch. Now, this is equivalent to saying that he has a call of 400 shares at $83\frac{7}{8}$ for nothing. So he has, and the operation is known as "turning a put-and-call into a call" by buying all the shares.

Just as in the example on page 15, we saw that the giver for the call of 200 Rio Tintos practically became the possessor of the put-and-call of one half the amount, so we find now that the giver for the put-and-call of 200 Louisville is able to turn his option into a call of twice the number.

To return to the subject of this example, Louis-

villes have no recovery in them beyond reacting to 78 on 13th February, and at the expiry of the option on contango day, at the end of March, the price has fallen to $75\frac{1}{2}$: the ledger shows the following entries :—

2nd January, 1892.				*27th March*, 1892.			
To $\$5\frac{1}{2}$ p.a.c. 200 L. and N. at $86\frac{3}{8}$ - - -	£205	0	0	By 200 Lou. N. at $86\frac{3}{8}$ (put)	£3455	0	0
30th January.							
To 200 L. N. at $76\frac{1}{8}$ x.d. - (bought)	3075	0	0				
To $\$2\frac{1}{2}$ div. on 200 shares -	100	0	0				
Balance - - -	75	0	0				
	£3455	0	0		£3455	0	0
				Balance of profit - (1⅛ on 200 shares.)	£75	0	0

The following shows a put-and-call of Chicago. Milwaukee, and St. Paul Shares which leaves a small margin of profit to the taker of the option money, and is therefore unprofitable to the giver.*

2nd May, 1891, given $\$4\frac{1}{4}$ put-and-call 100 Milwaukee at $66\frac{3}{4}$ end June.

We will suppose, in this case, that the giver is really in favour of a rise in Milwaukee Shares, but having often been mistaken before when he has "seen" a rise, he this time secures a put and call on not too onerous terms, and hopes to be able to do what we illustrated in a former example, *i.e.*, cover his risk by buying his 100 shares $\$4\frac{1}{4}$ lower than his option price. Then, if within the two months his

* It is not unusual for both giver and taker to make a profit out of an option, as, on the one hand the eventual difference in price may still leave a margin of profit to the taker of option money, and on the other the giver, under the protection of his option, may have "jobbed in and out" several times, and ultimately have secured more than he originally risked.

option has to run, Milwaukees rise well over $66\frac{3}{4}$, the difference is all his on 200 shares—double his original option amount.

This speculator is, however, doomed to disappointment, for he has embarked in his enterprise just before a period of unusual inactivity for American shares. The next week Milwaukees are down $1, a fortnight later they are quoted $65\frac{5}{8}$, only $1\frac{1}{8}$ under his option price, yet another week brings merely a niggardly $\frac{1}{8}$ move, and so on until at the very end of his term the price has barely managed to drop to $63\frac{3}{4}$. He buys the 100 shares so, and *puts* them at $66\frac{3}{4}$, saving $3 only out of the $4\frac{1}{4}$ risked.

His account shows his loss thus :—

2nd May, 1891.				*27th June.*		
To $4\frac{1}{4}$ p.a.c. 100 Milwaukees at $66\frac{3}{4}$	£85	0	0	By 100 Milwaukees at $66\frac{3}{4}$ (put)	£1335	0	0
27th June.							
To 100 Milwaukees at $63\frac{3}{4}$ (bought)	1275	0	0	By Balance	25	0	0
	£1360	0	0		£1360	0	0
Balance ($1\frac{1}{4}$ loss on 100 shares.)	£25	0	0				

This $1\frac{1}{4}$ on 100 shares is the profit to the taker of the money, unless he has jobbed against the option.

The next is an example of a put-and-call of New York Lake Erie and Western Shares, where the giver manages to make a profit by dealing in the shares under the cover of his option, although the ultimate price shows a margin of profit to the taker.

9th July, 1892, given $2\frac{7}{8}$ put-and-call 500 Erie at $26\frac{7}{8}$ end September.

Eries having been on the down grade all the year

(the price in the preceding January was about 35), the buyer of the put-and-call thinks there may be a reaction which will give him an opportunity of selling his shares and going for a further fall. His chance comes a month later.

On 6th August he sells 500 Eries at 29⅝ per end September.

This is $2\frac{3}{4}$ above his option price, so, if Eries continue to rise, he only stands to lose $\frac{1}{8}$. On the other hand, if they fall considerably, say below his option price, he stands to make a profit on the 500 he has sold, and the 500 he will *put*. In other words, for the risk of $\frac{1}{8}$ on 500 (= $\frac{1}{16}$ on 1000) he has the put of 1000 shares at his option price, or, as a dealer would express it, he has given $\frac{1}{16}$ for the put of 1000 Eries at $26\frac{7}{8}$. This would be a case of turning a put-and-call into a put by selling all the shares. His view proves to be correct, and the following week Eries are $28\frac{3}{8}$. He resolves to run the speculation until he can buy back under his option price, which he eventually succeeds in doing, for on

9th September he buys 500 Eries at 25⅜ per end September.

He has secured $\$4\frac{1}{4}$ on 500 shares, *i.e*, his $2\frac{7}{8}$ option money and a profit of $\$1\frac{3}{8}$ besides. He is "even" in the shares, he has a profit of $1\frac{3}{8}$ on 500 shares, and his *original put-and-call for nothing*. At the end of September he will make an *additional* profit of whatever Eries are over or under $26\frac{7}{8}$, and thus his circumstances are very comfortable.

As a matter of fact, at the end of his time Eries are $26\frac{1}{2}$ (only $\frac{3}{8}$ below his option price—a very lucky quotation for the dealer who ran the risk of the option, *i.e.*, the taker of the option money, who makes the difference between $2\frac{7}{8}$ option money and $\frac{3}{8}$ loss, unless indeed he has spoilt it by dealing in the stock), and the fortunate giver buys again 500 shares at $26\frac{1}{2}$, which he *puts* at $26\frac{7}{8}$.

The transaction is thus stated in the "giver's" ledger :—

End September, 1892, Account.

9th July.			*6th August.*		
To $\$2\frac{1}{4}$ p.a.c. 500 Eries at $26\frac{5}{8}$	£287	10 0	By 500 Eries at $29\frac{5}{8}$ (sold)	£2962	10 0
9th September.			*27th September.*		
To 500 Eries at $25\frac{3}{8}$ (bought)	2537	10 0	By 500 Eries at $26\frac{7}{8}$ (put)	2687	10 0
27th September.					
To 500 Eries at $26\frac{1}{2}$ (bought)	2650	0 0			
To Balance	175	0 0			
	£5650	0 0		£5650	0 0

Balance of profit £175 0 0
$1\frac{3}{8} + \frac{3}{8} = 1\frac{3}{4}$ on 500 shares.

The taker's ledger would show his profit thus, if he had run his option until the last moment without dealing against it :—

End September, 1892, Account.

27th September.			*9th July.*		
To 500 Eries (put at $26\frac{7}{8}$)	£2687	10 0	By $\$2\frac{1}{4}$ p.a.c. 500 Eries at $26\frac{7}{8}$	£287	10 0
			27th September.		
Balance	250	0 0	By 500 Eries at $26\frac{1}{2}$ (sold)	2650	0 0
	£2937	10 0		£2937	10 0

Balance of profit £250 0 0
$\$2\frac{1}{2}$ on 500 shares.

CHAPTER V.

THE CONVERSION OF OPTIONS.

THE arguments employed in the eight foregoing examples of optional dealings will lead the giver of option money to the following conclusions :—

1. That a call of a certain amount of stock can be converted into a put-and-call of half as much by *selling* one-half of the original amount.

2. That a put of a certain amount of stock can be turned into a put-and-call of half as much by *buying* one-half of the original amount.

3. That a call can be turned into a put by *selling* all the stock.

4. That a put can be turned into a call by *buying* all the stock.

5 and 6. That a put-and-call of a certain amount of stock can be turned into either a put of twice as much by *selling* the whole amount, or into a call of twice as much by *buying* the whole amount.

We must now inquire to what extent the original option money is affected by these hedging operations in the firm stock, and whether the option price moves or remains always the same. For this purpose let us take a simple example for each of the six cases above mentioned, it being understood that the bargains in firm stock are effected for the same date as that for which the option is done.

Example 1.

Given 1% call £2000 stock at 80.
Sold £1000 ,, 80.

At the end of the time, if the stock stands at 82, £2000 is called, of which £1000 is already sold at the option price; the other £1000 can be sold at 2% profit, which equalises the 1% on £2000. Anything over 82 would be profit on £1000.

If the stock stands at 78 the call is abandoned, the "bear" of £1000 is bought back at 78, and the 2% on £1000 again pays the 1% option money on £2000. Anything below 78 is profit on £1000; the position therefore can be expressed as: given 2% put-and-call of £1000 at 80.

Hence we are able to formulate the following rule:—

To sell half the stock at the option price against a call is equivalent to giving twice the amount of money for the put-and-call of half the quantity of stock at the *same* price.

Example 2.

The second example may, by way of variation, be explained by combining the single option *given* with the double option *taken*, thus:—

Given 1% put of £2000 stock at 80.
Bought £1000 ,, 80.

Then to close the operation—

Taken 2% put-and-call £1000 at 80.

Whatever may be the price of the stock at the end of the option period, the operator is "even". He has neither profit nor loss; for, *firstly*, if the stock has risen,

say, to 90, he abandons the put of £2000 at 80, the £1000 stock bought at 80 is called of him at the same price, and the amount of option money given and received is the same.

Secondly.—If the stock is quoted, say, 70—

Then he *puts* £2000 at 80.
He has bought £1000 at 80 ; and is
obliged to buy £1000 at 80,

which is *put* on him, the option money given and received again balancing.

The following rule is established from this example :—

If option money is given for the put, and half the amount of stock is bought against it at the option price, the dealer has practically given twice the option money for the put-and-call of half the stock at the *same* price.

Example 3.

A gives 1% call of £2000 stock at 80 ;
And sells £2000 ,, 80.
B gives 1% put of £2000 ,, 80.

If the stock is over 80 at the expiry of the option, A *calls* the £2000 he has sold at the same price and loses exactly the option money (1% on £2000).

B abandons the put and loses 1% on £2000. If, on the contrary, the stock is below 80, A abandons the call and secures as much as he can on the £2000 sold, anything below 79 (*i.e.*, 80 – 1% money) being his profit on £2000.

B exercises his put, and also benefits on £2000 to the extent of any difference below 80 – 1%. We see

therefore that whichever way the price goes the positions of A and B are identical, and our deduction is :—

If all the stock is sold by the giver against a call at the option price, it is equivalent to giving the same option money for the put of the same amount of stock at the *same* price.

Example 4.

Given 1% put £2000 stock at 80.

Bought £2000 ,, 80.

If the stock stands below 80 when the option expires, the £2000 bought at 80 are *put* at 80, and the option money is lost. If it stands over 80 the put is abandoned, and a profit is made on the £2000 bought ; the profit begins at 80 + 1% = 81 ; this is the same thing as if the giver had bought the call of £2000 at 1% instead of the put, and establishes the next rule, *viz.* :—

If a giver of money for the put buys the whole of the stock at the option price, he converts his operation into giving the same amount of money for the call of the whole amount of stock at the *option price*.

The 5th and 6th cases are too obvious to need illustration after the above examples, for it follows by inversion that if a call can be turned into a put-and-call of half the amount by *selling* half the stock, this same put-and-call can be converted into a call of twice the amount by *buying* all the stock ; the option money is first doubled and then halved, and the option price *always remains the same.*

The preceding examples have all been treated from the giver's point of view. It need hardly be men-

tioned that the principle remains the same whether the money is given or taken, only, when looking at it from the taker's side, the operation in the stock must be reversed. For instance, a taker for the call wishing to convert his option into the put-and-call, *buys* half the amount; and a taker of the put-and-call *sells* the whole of the stock in order to convert the operation into taking for the *call* of twice the amount, but *buys* the whole when he wishes to turn it into taking for the *put* of twice the amount, etc.

CHAPTER VI.

THE PRINCIPLES FORMULATED.

HAVING propounded the six principal rules of option dealing, it remains now to be shown how the option money is affected by dealing in the stock at a different price from that at which the option has been fixed. We know that a giver for the call converts his option into twice as much money for the put-and-call of half the amount of stock, if he sells half at the option price. Now, at whatever price he sells half the stock, he still converts his option into a put-and-call at the original option price, but the amount of money staked is increased or diminished according as he sells the stock under or over the option price.

It will not be necessary to give illustrations in each of the six examples considered in the last chapter, as the principle which we propose now to discuss applies equally to all optional dealing.

*Firstly.**

Selling against a call over the option price.

Given 1% call £2000 stock at 80.
Sold £1000 ,, 80½.

* The illustration is in each case regarded from the *giver's* point of view.

If the stock stands higher than 80 at the maturity of the option the £2000 will be called. ½% has previously been secured on £1000, so that the other £1000 must be sold 1½% above the option price (*viz.*, 81½) to cover the option money; anything over 81½ is profit on £1000. If the stock stands below 80 the call is abandoned, and the repurchase of the £1000 at 1½% under the option price (*viz.*, 78½) will cover the option money, anything below that being profit on £1000.

Obviously the same result would follow if the giver paid 1½% put-and-call of £1000 stock at 80. Hence we derive the following principle:—

If a call is turned into a put-and-call by selling half the stock over the option price, the put-and-call money is LESS *than double the call money by exactly the difference between the option price and the sale price.*

This difference we shall call the "distance," and adopting the symbols—

C = call money; p.a.c. = put-and-call money;
P = put money; D = distance,

the principle may be thus formulated—

P.a.c. (given) = 2C (given)—D.

From the giver's point of view this "distance" is favourable, for he sells over the option price. The formula would remain the same from the taker's point of view, but in that case the "distance" would be unfavourable, seeing that he *buys* half the stock *over* the option price.

Secondly.

Selling against a call under the option price.

Given 1% call £2000 stock at 80.

Sold £1000 „ 79.

It will be readily seen that if the stock at the end of the time is over 80, the £1000 hitherto unsold must fetch 83, in order to cover the 1% loss on £1000 and the 1% option money on £2000. On the other hand, should the call be abandoned, the £1000 must be repurchased at 77, in order to pay the 1% risked on £2000. In the first case, the difference over 83, and in the second case, the difference below 77, is profit on the £1000, which again is equivalent to the expression, "given 3% put-and-call of £1000 stock at 80;" and so we obtain our next rule, *viz.*:—

If a call is turned into a put-and-call by selling half the stock under the option price, the put-and-call money is GREATER *than double the call money by exactly the "distance" or difference between the option price and the sale price.*

Here is the formula:—

P.a.c. given = 2C given + D.

In reckoning the amount of option money involved, when converting any one option into another, it will be necessary to consider always whether the "distance" is favourable or unfavourable. The terms are naturally reversed when the giver's and taker's positions are compared. In like manner, in turning a put into a put-and-call, a purchase of half the stock *above* the option

price involves an unfavourable "distance," and may be expressed—

$$\text{P.a.c. (given)} = 2\text{P (given)} + \text{D.}$$

On the other hand, a purchase of half the stock below the option price ensures a favourable "distance," and diminishes the risk of the giver—

$$\text{P.a.c.} = 2\text{P} - \text{D.}$$

Again, from the taker's point of view, the "distances" are reversed, as he has to do the opposite transaction to that of the giver; therefore, in the two last formulæ + D is unfavourable to the giver but favourable to the taker, and − D is unfavourable to the taker but favourable to the giver.

It is easy to deduce from the above examples the necessary formula for the conversion of any other option by substituting + D for − D and *vice versâ* when the sense of the "distance" is changed by selling instead of buying, or by buying instead of selling: thus, if we wish to turn a put-and-call into a call by buying all the stock *above* the option price, we know that the distance in this case is unfavourable, and that

$$\text{P.a.c} = 2\text{C} + \text{or} - \text{D};$$

therefore 2C given = p.a.c. given + D (unfavourable),

$$\text{and C} = \frac{\text{p.a.c.} + \text{D}}{2}$$

Example.

Given 3¼% put-and-call of £1000 stock at 80.
Bought £1000 stock at 81½.

How can this be expressed in one term?

We know that the put-and-call is turned into the

call of £2000 at 80 ; it only remains to be shown how much option money is involved. Formula :—

$$C = \frac{\text{p.a.c.} + D}{2}$$

$$= \frac{3\frac{1}{4} + 1\frac{1}{2}}{2} = 2\,\tfrac{3}{8}\%$$

The present operation may therefore be expressed—

Given $2\frac{3}{8}\%$ call of £2000 at 80.

Again, if a put-and-call be converted into a put of double the amount by selling all the stock *above* the option price, the distance here is *favourable*, and we know already that

$$\text{P.a.c.} = 2P + \text{or} - D$$

$$2\ P\ (\text{given}) = \text{p.a.c. (given)} - D\ (\text{favourable}),$$

$$\text{therefore } P = \frac{\text{p.a.c.} - D}{2}$$

Example.

Given $2\frac{1}{2}\%$ p.a.c. £1000 stock at 80.
Sold £1000 stock at 81.

What is the equivalent of this operation in one term ? Formula :—

$$P = \frac{\text{p.a.c} - D}{2}$$

$$= \frac{2\frac{1}{2} - 1}{2}$$

$$= \tfrac{3}{4}\%$$

The equivalent in one term is therefore—

Given $\frac{3}{4}\%$ put of £2000 at 80.

The utility of the above formulæ becomes more apparent when it is proposed to give or take option

money at a price other than the market price of firm stock for the term in question. For example, the call of a certain stock at 80 for a fixed period is $1\frac{1}{2}\%$; what would the call be worth for the same period (1) at $80\frac{1}{4}$; (2) at $79\frac{3}{4}$?

Before discussing this point, it is necessary to observe that the *put-and-call* money on a stock for a given period would be the same, whether the actual market price for the period or a price a *little different* be stipulated, providing that the difference does not bear any considerable proportion to the whole amount of the put and call money involved. Indeed, it might suit a taker better to fix a price rather above or below the actual market price for the period. It is difficult to define how far this difference may go without affecting the premium, but it is fairly safe to say that no appreciable difference would be made if the "distance" did not exceed one-fourth part of the put-and-call money.

The reason is not far to seek. If a taker is willing to run the risk of a fluctuation of a stock from 80 for 3%, he would also be willing to fix, say, $80\frac{1}{2}$, as he would gain in the event of a rise exactly as much as he would lose in the case of a fall, and he does not begin his optional transaction *with any considerable portion of his option money "run off"*. Further, in nearly every instance in active speculative stocks, the chance of a rise or a fall is, to borrow a sporting expression, "even money betting".

To return to our examples: The call at 80 costs

$1\frac{1}{2}\%$. What is the call worth at $80\frac{1}{4}$? Now, we assume that p.a.c. at 80 = p.a.c. at $80\frac{1}{4}$; we know that the call must cost less at $80\frac{1}{4}$ than at 80; the formula therefore is—

$$C = \frac{\text{p.a.c} - D}{2} = \frac{3 - \frac{1}{4}}{2} = 1\frac{3}{8}$$

Again, what is the cost of the call at $79\frac{3}{4}$ when the right price is 80 and the put-and-call 3%?

The "distance" is unfavourable here to the option money risked. The formula therefore is—

$$C = \frac{\text{p.a.c.} + D}{2} = \frac{3 + \frac{1}{4}}{2} = 1\frac{5}{8}$$

So we see that if a stock stands at 80, and the put-and-call is 3% for a certain period at 80—

The call at $79\frac{3}{4}$ would cost $1\frac{5}{8}$,
,, at 80 ,, $1\frac{1}{2}$,
,, at $80\frac{1}{4}$,, $1\frac{3}{8}$,

and so on, the difference in the call money being always one-half of the "distance," or, to express it in another way, in giving for the call you deduct from the call money half as much as you add on to the price, or add on to the call money half as much as you take off the price. This conclusion can also be arrived at without examples by the use of our formulæ :—

$$C = \frac{\text{p.a.c.}}{2}$$

$$\text{and } C^1 = \frac{\text{p.a.c.} \pm D}{2}$$

$$C - C^1 = \frac{\text{p.a.c.}}{2} - \frac{\text{p.a.c.} + D}{2}$$

$$2(C - C^1) = D$$

That is, twice the difference in the option money is equal to the "distance".

It is quite usual for options to be done for long periods, *e.g.*, three months ahead, where the price fixed is considerably above or below the "right" price for the period; in these cases the call money is arranged on the basis of a put-and-call increased by an arbitrary amount calculated to cover the additional risk involved in taking option money with so much of the money already "*run off*" in one direction.

For example, the call of Milwaukees at the actual price of 65 for three months is, say, $\$2\frac{1}{2}$; that would make the put-and-call at 65 worth $\$5$. If the giver wishes to risk $\$1$ for the call, what price must he fix to do his business? If the put-and-call at both prices were equal, the answer would be—

$$D = 2\,(C - C^1)$$
$$= 2\,(2\tfrac{1}{2} - 1)$$

Distance = $\$3$ over the price.

Now, a dealer would not, as a rule, care to take $\$5$ put-and-call of Milwaukee $\$3$ over the right price, although the risk may be said to cut both ways. Milwaukee would have to rise from 65 to 73 before the taker would lose, and in the other direction his loss would begin proportionately sooner, *viz.*, after a $\$2$ fall to 63; the range of his risk, or, as the Americans call it, his "ten dollar straddle," would be from 63 to 73 instead of 60 to 70. But one of the reasons of his unwillingness to accept the same terms is that a taker of option money, from the nature of his business, *backs*

the inertia of the stock in which he is trading; just as the giver places his money on the rise or fall, or both. If the stock does not move at all during the run of the option money (an unusual event by the way), the taker who has fixed 65 makes the whole $5, whereas he would only make $2 out of the $5 if he had taken his put-and-call money on the basis of 68. When, therefore, a price is fixed considerably under or over the actual price, the put-and-call is considered to be worth a little more, but the increase in value cannot well be expressed in any fraction of the "distance," or said to bear any particular ratio to the whole of the "money"; it is rather a question of individual fancy at the time of dealing.

To come back to our present example: the taker thinks that in dealing about $3 out of the price, he ought to have $5\frac{1}{2}$ p.a.c. instead of $5, so, in answer to the question, what price must be fixed for $1 call of Milwaukees for three months when the right quotation is $5 p.a.c. at 65 and the taker asks $\frac{1}{2}$ more for the additional risk we have recourse to the same formula, C being $2\frac{3}{4}$ instead of $2\frac{1}{2}$.

$$\begin{aligned} D &= 2\,(C - C^1) \\ &= 2\,(2\tfrac{3}{4} - 1) \\ &= 3\tfrac{1}{2} \end{aligned}$$

The price to be fixed is accordingly $3\frac{1}{2}$ over the current quotation of 65, or $1 call at $68\frac{1}{2}$.

CHAPTER VII.

THE CALL O' MORE—PUT O' MORE.

HAVING now firmly established the principles involved in turning the single into the double option, and *vice versâ*, and having discussed the manner in which the original option money is affected by dealing in the firm stock at the option price, or at any other price, we shall be able to cope easily with the apparent intricacies of call o' more and put o' more transactions.

We have seen in the chapter on *definitions* that the call o' more is an option carried in a purchase of firm stock effected at a price which is above the right market price for the period in question.

It now remains to be shown, with the assistance of the principles already laid down, at what prices such transactions should be arranged, given a certain put-and-call value.

From its very nature the call o' more or put o' more must of necessity be an optional bargain at a price other than the right price, seeing that the option money is *included* in the price at which the stock is bought or sold. Consequently transactions of this description are not often done for long periods ahead, for the "distance" would become so large that the option would have to be very dear to compensate the taker's

risk in commencing a "long shot" operation with a considerable amount of the money "run off". Call o' more bargains are therefore more freely done from day to day or for a week, one account or one month ahead.

We will first follow one of these fancy options through in the manner adopted with the examples given in chapters iii. and iv.

On 20th August, 1892, De Beers Shares stand at $14\frac{3}{8}$. The three months' call until the middle November account is worth, say, $\frac{15}{16}$ per share. Our operator "sees his way" to buy

200 De Beers Shares at $15\frac{3}{16}$ call o' more middle of November account.

The price of $15\frac{3}{16}$ includes the contango rate for five accounts (end August, mid and end September, mid and end October), and as this rate has been ruling about 9d. per share, $\frac{3}{16}$ must be allowed for contangos. The speculator, therefore, has paid $\frac{5}{8}$ above the right market price for the period for 200 shares, in order to have the privilege of calling 200 more at the same price at the end of the time. By *3rd September* the price has reached $15\frac{1}{16}$, which, with allowance for contangos, would be just about $15\frac{3}{16}$ for the mid November account: he could now sell his firm stock at cost price, and be left with the call of 200 shares for nothing. He keeps it, however, for another week, and on

10th September sells 200 shares at $15\frac{11}{16}$ for the mid November account.

Whatever happens now, he will make a profit of 10/- per share on 200 shares, and he still has the call of 200 shares at $15\frac{5}{16}$ for nothing. For the next month there are but small variations, and, thinking to provide still further against contingencies, on

8th October he sells 100 shares at $15\frac{15}{16}$ per mid November.

His position now is : having first secured a profit of $\frac{1}{2}$ per share on the firm 200, he again secures $\frac{3}{4}$ on 100 shares, and, as shown in former examples, he has the put-and-call of 100 shares at $15\frac{3}{16}$ for nothing ; so that, besides the above profit, he stands to net an additional gain on 100 shares of whatever De Beers are above or below $15\frac{3}{16}$ at the middle of November. The rise continues, and by the contango day of the middle of November account, when his option has to be declared, De Beers have reached $17\frac{3}{8}$, at which price he sells the remainder of his stock, thus scoring another $2\frac{3}{16}$ on 100 shares.

His account is booked thus :—

Mid November, 1892, *Account.*

20th August.				*10th September.*			
To 200 De Beers at $15\frac{5}{16}$ (call o' more)	£3037	10	0	By 200 De Beers at $15\frac{11}{16}$ (sold)	£3137	10	0
10th November.				*8th October.*			
To 200 De Beers at $15\frac{5}{16}$ (called)	3037	10	0	By 100 De Beers at $15\frac{11}{16}$ (sold)	1593	15	0
Balance	393	15	0	*10th November.*			
				By 100 De Beers at $17\frac{3}{8}$ (sold)	1737	10	0
	£6468	15	0		£6468	15	0

Balance of profit			£393 15 0
$\frac{1}{2}$ on 200	£100	0	0
$\frac{3}{4}$ on 100	75	0	0
$2\frac{5}{16}$ on 100	218	15	0
	£393	15	0

We see from the foregoing example that, in order to turn a call o' more into a put-and-call, the giver or buyer must first sell the whole of the firm stock and then half as much again. He thus obtains a put-and-call of half the original amount at the *same price.*

Let us now ascertain what amount of put-and-call money was represented in his purchase of 200 De Beers at $15\frac{3}{16}$, when the right market price for the period was $14\frac{3}{8} + \frac{3}{16}$ contango = $14\frac{9}{16}$.

He gave $15\frac{3}{16} - 14\frac{9}{16} = \frac{5}{8}$ for the call of 200 shares at $\frac{5}{8}$ distance *over* the price.

Now, p.a.c. given = 2C given + D (unfavourable)

$$= 1\frac{1}{4} + \frac{5}{8}$$

$$= 1\frac{7}{8}.$$

His option risk, therefore, was on the basis of $1\frac{7}{8}$ put-and-call at $15\frac{3}{16}$.

This may be more clearly illustrated in the following manner :—

De Beers are $14\frac{9}{16}$ per mid November account.

A buys 200 shares at $15\frac{3}{16}$ call o' more,
and sells 300 shares at $14\frac{9}{16}$ (market price);
B gives $1\frac{7}{8}$ put-and-call of 100 shares at $15\frac{3}{16}$,
C gives $\frac{5}{8}$ call 200 shares at $15\frac{3}{16}$;
and sells 100 shares at $14\frac{9}{16}$;
D gives $1\frac{1}{4}$ put 200 shares at $15\frac{3}{16}$,
and buys 100 shares at $14\frac{9}{16}$.

Whatever De Beers mark at the end of the option period, all four operators are in exactly the same position.

A having sold 200 at $\frac{5}{8}$ loss, practically gives that

amount for the call of 200 shares $\frac{5}{8}$ over the price, and then, having sold another 100 at $\frac{5}{8}$ "unfavourable distance," converts his option into a put-and-call of 100 shares at the original price—

$$\begin{aligned} \text{P.a.c.} &= 2\text{C} + \text{D} \\ &= 1\tfrac{1}{4} + \tfrac{5}{8} \\ &= 1\tfrac{7}{8} \text{ p.a.c. at } 15\tfrac{3}{16}. \end{aligned}$$

By the same formula we see that C, having converted his call of 200 into a put-and-call of 100, gives

$$\begin{aligned} \text{P.a.c.} &= 2\text{C} + \text{D (unfavourable)} \\ &= 1\tfrac{7}{8} \text{ put-and-call at } 15\tfrac{3}{16}. \end{aligned}$$

D begins in the opposite direction, but has a "favourable distance," and his position being also a put-and-call of 100 shares, is expressed by the formula—

$$\begin{aligned} \text{P.a.c.} &= 2\text{P} - \text{D (favourable)} \\ &= 2\tfrac{1}{2} - \tfrac{5}{8} \\ &= 1\tfrac{7}{8} \text{ p.a.c. at } 15\tfrac{3}{16}. \end{aligned}$$

A, C, and D, therefore, have only gone a roundabout way to do what B has done in one transaction, *viz.* :—

Given $1\frac{7}{8}$ p.a.c. 100 De Beers at $15\frac{3}{16}$.

We have now only to go one step further to arrive at the formula for the call o' more or put o' more, which latter works on the same principle as the former, but in the selling direction.

We have seen that the buyer of the call of more practically *gives the distance* for the call at a price equal to the market price, plus the distance.

Now, p.a.c. = 2C + D (unfavourable *)
therefore, p.a.c. = 2D + D = 3D

and $D = \frac{\text{p.a.c.}}{3}$

Therefore the distance of a call o' more = $\frac{\text{p.a.c.}}{3}$

and the distance of a put o' more is likewise $\frac{\text{p a.c.}}{3}$

Exercise.

If, when a stock stands at 80, A buys £2000 at 81½ call o' more, and B is willing to give 4¾ put-and-call of £1000 stock at 81½, what profit would A have if he dealt with B, and how much stock must he sell to secure his position?

If A sells £2000 stock at 80, he has then given 1½% call £2000 at 81½ (1½ distance); he can turn the operation into a put-and-call of £1000 by selling another £1000 at 80;

he has then given p.a.c. = 2C + D
= 3 + 1½
= 4½ p.a.c. at 81½.

So that, if he sells in all £3000 stock, and takes from B 4¾% p.a.c. £1000 at 81½, his position is "even," and he has secured ¼% on £1000 stock.

Exercise.

A stock stands at 80. Given that the put-and-call is 3% for a certain period, what price is the stock (1)

* *N.B.*—In buying call o' more, or in selling put o' more, the "distance" must always be unfavourable.

call o' more; (2) put o' more? (3) What is the call worth at $80\frac{3}{4}$?* (4) What is the put worth at $79\frac{1}{2}$?

(1) Call o' more = $\frac{\text{p.a.c.}}{3}$ = 1% above the price.

Answer, 81.

(2) Put o' more = $\frac{\text{p.a.c.}}{3}$ = 1% below the price.

Answer, 79.

(3) Call given = $\frac{\text{p.a.c.} - \text{D}}{2} = \frac{3 - \frac{3}{4}}{2} = 1\frac{1}{8}$.

Answer, $1\frac{1}{8}$ call at $80\frac{3}{4}$.

(4) Put given = $\frac{\text{p.a.c.} - \text{D}}{2} = \frac{3 - \frac{1}{2}}{2} = 1\frac{1}{4}$.

Answer, $1\frac{1}{4}$ put at $79\frac{1}{2}$.

Exercise.

Bought £4000 stock at 80 call o' more.

Sold	1000	,,	78.
,,	1000	,,	$78\frac{3}{4}$.
,,	2000	,,	$79\frac{3}{8}$.
,,	2000	,,	$80\frac{1}{4}$.

What single transaction would now make the position even, without profit or loss?

The first £4000 stock is sold at an average of $78\frac{7}{8}$. The risk is therefore limited to $1\frac{1}{8}$ on £4000, and can be expressed: Given $1\frac{1}{8}$ call £4000 stock at 80. Now, this is converted into a put-and-call of £2000 by selling one half the option stock at $80\frac{1}{4}$—

$$\begin{aligned} \text{P.a.c.} &= 2\text{C} - \text{D} \\ &= 2\tfrac{1}{4} - \tfrac{1}{4} \\ &= 2\% \end{aligned}$$

* Presuming that p.a.c. at 80 = p.a.c. at $80\frac{3}{4}$, see page 36.

which can in turn be expressed: Given 2% put-and-call £2000 stock at 80.

The operator must therefore *take* 2% put-and-call of £2000 stock at 80, in order to make himself even without profit or loss.

Exercise. (From the *taker's* point of view.)

Bought £2000 stock at 80 put o' more. Given that this option money has been taken, on the basis of $2\frac{1}{4}$% put-and-call, what is the present price of the stock for the period in question?

Now, we know that the stock must stand higher than 80, for the buyer, who is here the taker of option money, has allowed for the option money in the price.

$$\text{Put o' more} = \frac{\text{p.a.c.}}{3} = \frac{2\frac{1}{4}}{3}$$

$$D = \tfrac{3}{4}\%.$$

Therefore, the stock must now be $80\frac{3}{4}$.

Exercise. (From the *taker's* point of view.)

Sold £2000 stock at 80 call o'more, given that the put and call is 3%; at what price would this dealer buy stock put o'more? *

We must first find the market price of the stock.

$$\text{Call o' more} = \frac{\text{p.a.c.}}{3}$$

$$\text{therefore } D = 1$$

and the market price must be 79.

Now if the stock stands at 79, and the dealer is willing

* In this exercise the question of contangoes is not considered.

to take 3°/₀ put-and-call, even if the price fixed is 1°/₀ out of the market price, he would also buy the stock put o' more at a distance of $\frac{\text{p.a.c.}}{3} = 1$. Answer, 78.

In the introduction, it was stated that the amount of option money involved in a call of more transaction was greater than would appear at first sight to the uninitiated. Take the following illustration: From time to time there have been immense optional transactions done in Consols, and at those times the difference between the buying and selling price of £100,000 consols would seldom exceed $\frac{1}{8}$%. Thus, at a given moment we will say Consols are $105\frac{1}{2}$-$\frac{5}{8}$. An option dealer (not a jobber in the Consol market) is anxious to sell a block of Consols for which he would perhaps be willing to take $105\frac{1}{2}$. As, however, he has a buyer of Consols call o' more, he sells them to him at $105\frac{5}{8}$ call o' more for the account ten days ahead. He has apparently only asked the full market turn, and has "thrown in an option". But on examination it appears otherwise. It would have suited him to sell his Consols at $105\frac{1}{2}$, but finding a giver of option money, he charges him $105\frac{5}{8}$ call o' more. The seller, from his own point of view, has thus taken $\frac{1}{8}$ call at $\frac{1}{8}$ above the price—equivalent to $\frac{3}{8}$ put-and-call at $105\frac{5}{8}$; which will admit of a fluctuation of $\frac{3}{4}$°/₀ (from $105\frac{1}{4}$ to 106) without causing him loss. Thus a "straddle" of $\frac{3}{4}$°/₀ seems to be the result of *getting* instead of *giving* the turn of the market.

CHAPTER VIII.

THE CALL OF TWICE MORE, THREE TIMES MORE, ETC.

In doing a call o' more transaction, the price at which the firm stock is bought may carry the right to purchase more than an equal amount of the stock at the same price; it may give the buyer the privilege of calling *twice more*, *three times more*, or indeed *any number of times more;* but in this country such fancy options are not much done, although in Germany the call of twice more (*zweimal noch*) is not unfrequently negotiated.

It may, nevertheless, be of interest to give the formulæ upon which the prices are based for these optional transactions, more especially as the sequence of fractions is somewhat curious and withal easy to remember.

Firstly.—If a stock stands at 80, at what price ought one to buy it call of twice more, when the put-and-call is 3%?

Now, in this case the "distance" given in the firm stock is to carry a right to call twice the quantity at the whole distance above the price. The

option money staked is, therefore, one half of the distance.

$$\text{P.a.c.} = 2C + D$$

$$\text{Now here } C = \frac{D}{2}$$

$$\text{therefore p.a.c.} = D + D$$

$$\text{therefore } D = \frac{\text{p.a.c.}}{2} = \frac{3}{2} = 1\tfrac{1}{2} \text{ over the price.}$$

Answer $81\frac{1}{2}$.

Again, what is the "distance" of a call of three times more? Here the call money is one-third of the "distance" given on three times the amount of stock :—

$$\text{P.a.c.} = 2C + D$$

$$\text{here } C = \frac{D}{3}$$

$$\text{therefore p.a.c.} = \frac{2D}{3} + D$$

$$= \frac{5D}{3}$$

$$\text{and } D = \frac{3 \text{ p.a.c.}}{5}$$

Hence if the stock stands at 80, and the put-and-call is 5%, then the price would be 83 call of three times more.

Thus we see that the call of twice more is worth at least $\frac{\text{p.a.c.}}{2}$ over the price, the call of three times more $\frac{3 \text{ p.a.c.}}{5}$ over the price, and by the same process we can ascertain the distance of call of n times more.

$$\text{P.a.c.} = 2C + D. \quad \text{Now } C = \frac{D}{n}$$

$$\text{therefore p.a.c.} = \frac{2D}{n} + D$$

$$= \frac{2D + nD}{n}$$

$$= D\,\frac{(n+2)}{n}$$

$$\text{therefore } D = \frac{n\,(\text{p.a.c.})}{n+2}$$

Or, putting it more plainly, the "distance" involved in a call of any number of times more is that fraction of the put-and-call money represented by a numerator equal to the number of times more, and a denominator equal to the same number + 2.

To recapitulate—

Call of more $= \frac{1 \text{ p.a.c.}}{3}$ over the price.

,, twice more $= \frac{2 \text{ p.a.c.}}{4} = \frac{\text{p.a.c.}}{2}$,,

,, three times more $= \frac{3 \text{ p.a.c.}}{5}$,,

,, four ,, $= \frac{4 \text{ p.a.c.}}{6} = \frac{2 \text{ p.a.c.}}{3}$,,

,, five ,, $= \frac{5 \text{ p.a.c.}}{7}$,,

,, six ,, $= \frac{6 \text{ p.a.c.}}{8} = \frac{3 \text{ p.a.c.}}{4}$,,

,, seven ,, $= \frac{7 \text{ p.a.c.}}{9}$,,

etc., etc. In practice it would be found that a giver could not as a rule "get on" at the figures obtained by

the preceding formula, for the reason set forth in chapter vi. For instance, supposing a stock is 80 and the put-and-call 4°/₀, then, according to the formula that stock would be worth buying at 83 call of six times more. But what is the taker's position then? Assuming that he has sold £1000 stock at 83 call of six times more he must first rebuy the £1000 firm at 80; he has then taken—

3°/₀ on £1000 = ½°/₀ on £6000 call at 83.

If he now wishes to turn his position into put-and-call—

He buys £3000 more at 80,
then p.a.c. = 2C + D (favourable to taker)
= 1 + 3
= 4°/₀

He has taken 4°/₀ put-and-call of £3000 stock with three-fourths of the option money already run off, and has dealt in £5000 stock firm in order to do it. Probably no dealer would be willing to run such a risk on these terms, *viz.*, on the basis of the current rate for the put-and-call.

Exercise.

A stock is quoted at 80, and the put-and-call for a certain period is about 2¼°/₀. A is willing to take 2⅜°/₀ put-and-call of the stock at about 1½°/₀ above the price. B will take 2⅜°/₀ put-and-call at about 1½°/₀ below the price. At what price would a dealer

(1) Sell £2000 call of three times more;

(2) Buy £2000 put of three times more,

to leave himself a profit of ⅛ on the put-and-call?

And how must he hedge in the firm stock to make himself "even?"

(1) If he wants $\frac{1}{8}$ profit he must secure $2\frac{1}{2}$% put-and-call.

Now call of three times more $= \frac{3 \text{ p.a.c.}}{5} = \frac{3 \times 2\frac{1}{2}}{5} = 1\frac{1}{2}$.

He would therefore sell £2000 stock at $81\frac{1}{2}$ call of three times more, and in order to fix his profit he must first buy £2000 stock at 80. He then stands thus: Taken $\frac{1}{2}$% call of £6000 stock at $81\frac{1}{2}$. Next, by buying £3000 more at 80, his position is: Taken $2\frac{1}{2}$% p.a.c. of £3000 stock at $81\frac{1}{2}$. He then gives A $2\frac{3}{8}$ p.a.c. of £3000 stock at $81\frac{1}{2}$. He has thus levelled his position, has secured $\frac{1}{8}$ profit on £3000 stock, and in order to accomplish this he has had to buy £5000 stock

(2) In the same manner,

put of three times more $= \frac{3 \text{ p.a.c.}}{5} = \frac{3 \times 2\frac{1}{2}}{5} = 1\frac{1}{2}$;

so our dealer would buy £2000 stock at $78\frac{1}{2}$ put of three times more. Then, in order to be able to secure his profit by dealing with B, he first sells at 80 the £2000 he has bought at $78\frac{1}{2}$. He has thus taken $\frac{1}{2}$% put of £6000 stock at $78\frac{1}{2}$. He next sells further £3000 stock at 80, and his position is, by the formula p.a.c. = 2 P + D:—taken $2\frac{1}{2}$ p.a.c. of £3000 at $78\frac{1}{2}$. Accordingly, by giving B $2\frac{3}{8}$ p.a.c. of £3000 at $78\frac{1}{2}$ he secures $\frac{1}{8}$ profit on £3000 stock and makes himself "even," the operation having necessitated the sale of £5000 firm stock.

CHAPTER IX.

THE SINGLE OPTION DISGUISED.

In all the examples of option dealing considered in former chapters, the operator has been made to deal against his options in firm stock for the option period. In actual practice this is frequently very difficult to do, especially when it is a question of dealing for two or three months ahead in times of excitement and great speculation. At such seasons a buyer of stock for forward delivery would have to make a great concession in the price in return for the convenience of avoiding a difficult contango. Again, it may occur that, on account of some very bad news, a certain stock has been much oversold; that is to say, many people not possessing any stock themselves, may have sold "bears" of considerable quantities, which, at the following contango day, they must either borrow or buy back. Holders, in such cases, if they lend their stock at all, may demand a "backwardation," of which speculative "bulls" also get the full advantage. In the war scare, some ten years ago, Russian stocks were so freely sold here by "bears" that the German holders were able to exact from $\frac{1}{2}$% to $1\frac{1}{2}$% backwardation per account for the loan of their stock for many months. At that time it would have been more difficult to give

for the put of Russian than for the put-and-call—for this reason: A taker of option money, as a rule, does not wish to run a single option, for that would be purely a matter of taking a view for the rise or the fall. He likes to turn every single option straight away into a double option, because, in spite of then "standing to be shot at" in both directions, he is covered by twice the amount of option money on half the quantity of stock, and, as we said in a former chapter, he likes to back the *inertia* of the stock in preference to taking a view of its *activity* one way or the other. Now, if an option dealer had already taken money freely for the put of Russian stock, and in every case sold one half of the amount for the current account, he would find himself at each settlement a big borrower of stock at a growing backwardation, which was perhaps not allowed for at all at the time of dealing. In such a case, although he might be willing to increase his "book" in the put-and-call, he would be very unwilling to increase his "bear" position in the firm stock. To put it into figures, he would probably say to an intending giver: "I will take $5\frac{1}{2}$% *put-and-call* of £5000 stock at 82 for three accounts ahead, but if you want to give for the *put* I must protect myself and fix either $3\frac{1}{4}$% put at 82, or $2\frac{3}{4}$% at 81".

An operator, in order to disguise his position and avoid suspicion, may elect to give for the put-and-call of a stock instead of either the call or the put, and afterwards turn his position into the single option by degrees. There is a story of a German banker,

anxious to dispose of a large amount of some bank stock, approaching an option dealer who, after some conversation upon the merits of the stock in question, took money from him for the put-and-call of a considerable portion of the amount the banker really wished to dispose of. Some little time after the option dealer found that the stock was easier to buy than to sell, and not wishing to have this large block thrown on his hands he took every opportunity of raising the price whenever it could be done at the expense of buying a few thousand pounds more of the stock. A short time before the option became due the selling seemed to have ceased, and, in fact, the price rose so rapidly that the option dealer began to wonder where he would get the balance of stock from in case it was *called* of him. Indeed, so great was his uneasiness that by degrees he covered the whole of his position, the seller of the stock, unknown to him, being his option giver; and on the day the option was due, the price was so far above the option price that no doubt was left in his mind as to which way the banker would declare his option. At option time the banker approached the dealer, who said: "I congratulate you on the fine profit you have on your option; you, of course, *call* the whole of your amount". "On the contrary," replied the knowing banker, "I do not *call* any; I *put* it on you." And the operation being well timed, an unfavourable announcement concerning the affairs of the institution was made that afternoon, and the option

dealer found himself the unwilling possessor of the whole amount of stock which had belonged to the banker, who throughout the operation had never once been obliged to show his hand.

The above anecdote, which is probably fictitious, is not quoted so much with a view to dwell upon the ethics of Stock Exchange transactions as to remind the reader that the apparent market in 100 shares is one thing, and the actual market in 10,000 something very different.

CHAPTER X.

OPTION-DEALING ABROAD.

ALTHOUGH very large transactions are from time to time done on the French and German markets in options, London is *par excellence* the option market of the world. Perhaps the largest individual transactions have been done in Paris, where speculators occasionally deal in amounts which are almost unheard of on this side; but there is nowhere the same facility for giving and taking, for operating in long and short options, and for hedging against a favourable put or call in the firm stock as that which exists in London. It rarely happens that an option is done in the Paris market for more than one month ahead, and in Berlin too the majority of such dealings are arranged for a similar period. In London two and three months' calls are easily negotiated in the active stocks.

Moreover it is curious to note that only in English is it easy to express in one term the various positions relating to option dealing. Both the French and the German expressions for any option other than a plain call are as a rule awkward—frequently even ambiguous. The difficulty of expressing "which way" a person intends to deal is sometimes overcome in German by adding on at the end of the sentence,

"I remain still" *(Ich bleibe still)*, or "you remain still" *(Ihr bleibet still)*, which means in the first case *you* are giving the option money, and in the latter *I* am giving the option money. A certain confusion of the English and German option expressions is brought about by the different sense in which the words to give and to take are used in the two languages. In English, to "give for the call" or to "give option money" means to *buy the option*, whereas in German *geben* is generally used in the sense of "to sell". Again, *nehmen* means *to take*, but the German word conveys the idea of buying when applied to transactions in stocks.

The French language provides very few direct and clear expressions in connection with option dealings. An option is known as *une option* or *une prime* (a premium), but no good expression exists for either a call or a put, the former being known as *une prime*, and the latter, on the rare occasions when it may be required, being interpreted as "the right to be able to deliver". The terms for the call and put in German are more expressive. They are "the forward premium" *(Vorprämie)* and the "back premium" *(Rückprämie)*. In Germany the put-and-call is treated somewhat differently from the London method. It is called *Die Stellage* for which no English equivalent can be found, but which corresponds with the American expression "straddle". A put-and-call of 2% at 80 covers a range of 4% from 78 to 82; this 4% range or straddle is called the *Stellage* in German. There-

fore the straddle or *Stellage* is twice the put-and-call and four times the single option.

The term call o' more finds an equivalent in German, "the option with more" *(Option auf mehr*, or *Prämie mit noch)*, but none in French. The best expression that the French language can provide for the call of more is "the right of being able to claim the same quantity," but as this operation is hardly ever practised in France, it does not matter much.

The custom of speaking of "so much option money *at* such and such a price" is only prevalent in England. The foreign mode of expression, "a certain price, *of which* so much is option money," is convenient in relation to calls, but breaks down completely if one attempts to apply it to puts. Give ¾ call of £5000 stock at 80 is very neatly turned as "*Achetez*, £5000 at 80¾, *dont* ¾," or "*Kaufet*, £5000 *zu* 80¾, *dont* ¾". But where are we when we want to telegraph to Paris with as much economy as is consistent with business principles, "Give ¾ put of £5000 at 80," and have to say, "*Payez* ¾% *pour avoir le droit de pouvoir livrer* £5000 *à* 80"?

Again, in a call o' more or put o' more transaction, there is a crispness in the English expression which leaves no doubt as to which way the person giving his instructions wishes to act. It is quite clear that any one who desires to buy call o' more or to sell put o' more is a giver of option money, and that he would be a taker of option money if his instructions read "sell call o' more," or "buy put o' more". The intention of the operator, however, is not quite so transparent when

his instructions are given in such terms as, "*Achetez*, £2000 *à* 80, *donnant le droit de pouvoir livrer autant*," or "*Kaufet*, £2000 *zu* 80, *mit einmal noch Rück-prämie*".

The following brief vocabulary in English, French and German of expressions incidental to dealing in stocks, more particularly in relation to optional transactions, may be of some little use :—

English.	*French.*	*German.*
A call.	Une prime.	Eine Vorprämie.
A put.	Le droit de pouvoir livrer.	Eine Rückprämie.
The put-and-call.	La double prime.	Die Stellage, die Doppelprämie.
A call of more.	Le droit de pouvoir demander la même quantité.	Eine option auf mehr (or, eine Prämie mit noch).
A put of more.	Le droit de pouvoir livrer la même quantité.	Eine Rückprämie mit noch.
A call of twice more.	Le droit de pouvoir demander le double de la quantité.	Eine option mit zweimal noch.
Take ¾% call of £5000 stock at 80.	Vendez £5000 à 80¾ dont ¾.	Verkaufet £5000 zu 80¾ dont ¾.
Give ¾% call of £5000 stock at 80.	Achetez £5000 à 80¾ dont ¾.	Kaufet £5000 zu 80¾ dont ¾.
Give ¾% put of £5000 stock at 80.	Payez ¾% pour avoir le droit de pouvoir livrer £5000 à 80.	Zahlet ¾% Rückprämie auf £5000 . . . à 80.
Give 1½% put-and-call of £5000 at 80.	Payez la double prime 1½% sur £5000 à 80.	Kaufet £5000 Doppelprämie zu 80 mit 1½% Stellagengeld.
Buy £2000 stock at 80 call o'more.	Achetez £2000 à 80 avec le droit d'en avoir autant au même cours.	Kaufet £2000 zu 80 mit einmal noch.
Sell £2000 stock at 80 call o'more.	Vendez £2000 à 80 donnant le droit de pouvoir demander autant au même cours.	Verkaufet £2000 zu 80 mit einmal noch Vorprämie.
Buy £2000 stock at 80 put o'more.	Achetez £2000 à 80 donnant le droit de pouvoir livrer autant.	Kaufet £2000 zu 80 mit einmal noch Rückprämie.
Sell £2000 stock at 80 put o'more.	Vendez £2000 à 80 avec le droit d'en livrer autant.	Verkaufet £2000 zu 80 mit einmal noch Rückprämie.
Give 1½% call of £2000 Italian ½% over the price.	Achetez £2000 Italien 2% écart dont 1½.	Kaufet £2000 Italiäner mit 2% écart dont 1½%.
Take 1½% call of £2000 Italian ½% over the price.	Vendez £2000 Italien 2% écart dont 1½.	Verkaufet £2000 Italiäner mit 2% écart dont 1½%.
Give 1% put of £2000 Italian ½% under the price.	Achetez le droit de pouvoir livrer £2000 Italien 1½% écart dont 1.	Kaufet die Rückprämie auf £2000 Italiäner mit 1½% écart dont 1% Rück.
Take 1% put of £2000 Italian ½% under the price.	Vendez le droit de pouvoir livrer £2000 Italien à 1½% écart dont 1.	Verkaufet die Rückprämie auf £2000 Italiäner mit 1½% écart dont 1% Rück.
At what price can you give 1% call of Italian for two months?	Comment pouvez-vous acheter la prime dont 1% sur l'Italien à deux mois?	Wie kann man Italiäner dont 1% auf zwei Monate kaufen?
At what price can you give 1% put of Italian for two months?	Comment pouvez-vous acheter le droit de pouvoir livrer l'Italien à deux mois dont 1%?	Wie kann man die Rückprämie dont 1% auf Italiäner für zwei Monate kaufen?
If the call at the right price is 1%, at what "distance" can you give ¾%?	S'il y a un point d'écart dont un sur le cours du jour, avec quel écart pouvez-vous acheter dont ¾%?	Falls die Vorprämie dont 1 ein prozent écart bedingt mit welchem écart können Sie dont ¾ kaufen?

at what price can you give ¾% ?

The put-and-call can be done at 80.
Buy me £10,000 Italian and take 3% put-and-call of £5000, combined order.

Give 1% call of £10,000 Italian and take 2% put-and-call of half the quantity.
The option is cheap.
The option is dear.
There are no givers of option money.
There are no takers of option money.

The put-and-call is worth 2%.

The option expires this account.
The option expires next account.
The call expired three months ago.
The contango is high.
The backwardation is stiff.
There are no takers in of the stock.

There are no givers on the stock.

At what rate can you *give on* my "bull"?
At what rate can you *take in* my "bear"?
If you cannot *give* 4% on my stock I will take up.
If you can *get* 4% on my stock I will not deliver.
I want to take up £5000 stock, please *give on* the remaining £5000.
I wish to deliver £2000 stock, please *take in* the other £3000.
The bonds are not good delivery.
The bonds have been sold for the "coming out" or special settlement.
I wanted to sell the stock for cash.

un, avec quel écart pouvez-vous vendre dont ¾% ?
La double prime est faisable à 80.
Achetez £10,000 Italien et vendez la double prime sur £5000 à 3% ordre lié.

Achetez dix-mille Italien dont un et vendez la double prime sur la moitié avec 2%.
La prime est bon marché.
La prime est chère.
Il n'y a pas d'acheteurs de primes.
Il n'y a pas de vendeurs de primes.

La double prime vaut 2%.

La prime échoit cette liquidation.
La prime échoit la liquidation prochaine.
L'option est échue il y a trois mois.
Le report est cher.
Le déport est cher.
Il n'y a pas de reporteurs pour la valeur.

Personne ne veut se faire reporter sur la valeur.
A quel taux pouvez-vous *faire reporter* ma position acheteur ?
A quel taux pouvez-vous *reporter* ma position vendeur ?
Si vous ne pouvez pas vous *faire reporter* à 4%, je leverai les titres.
Si vous pouvez *reporter* à 4% je ne livrerai pas.
Je lève £5000, veuillez *faire reporter* les autres £5000.
Je désire livrer £2000, *reportez*, s'il vous plaît, les restantes £3000.
Les titres ne sont pas livrables.
Les titres ont été vendus à l'émission ou à liquidation spéciale.
J'ai voulu vendre le titre au comptant.

zent ecart bedingt mit welchem ecart konnen Sie dont ¾ verkaufen?
Die Stellage ist zu 80 zu machen.
Kaufet £10,000 Italiäner und verkaufet £5000 Stellage mit 3% Stellagengeld, nur zusammen auszuführen.
Kaufet £10,000 Italiäner Prämie dont 1 und gebet die Stellage auf die Hälfte, mit 2% Stellagen geld.
Die Prämie ist billig.
Die Prämie ist theuer.
Es sind keine Prämien Käufer am Markte.
Es sind keine Prämien Verkäufer am Markte.
Die Doppelprämie ist 2% Stellagengeld werth.
Die Prämie verfällt diese Liquidation.
Die Prämie verfällt nächste Liquidation.
Die option verfiel vor drei Monaten.
Der Report ist hoch.
Der Deport ist hoch.
Es sind keine Hereinnehmer von diesen Werthen am Markte.
Es sind keine Hereingeber am Markte.

Zu welchem Satze können Sie meine Hausse Position hereingeben?
Zu welchem Satze können Sie meine Baisse Position hereinnehmen?
Falls Sie nicht zu 4% hereingeben können nehme ich die Titres ab.
Falls Sie zu 4% hereinnehmen können liefere ich nicht ab.
Ich nehme £5000 auf gebet restliche £5000 herein.
Ich liefere £2000, bitte nehmet die restlichen £3000 herein.
Die Stücke sind nicht lieferbar.
Die Stücke wurden "per erscheinen" oder "per besondere Liquidation" verkauft.
Ich wollte die Stücke per Cassa verkaufen.

CHAPTER XI.

THE VALUE OF THE PUT-AND-CALL.

THE reader of the headline to this chapter will probably ask, "What do you mean by the *value* of a put-and-call? The *price* of a put-and-call may be quoted in the option market at a given moment, but what the value of that option is no one can say until it has expired." And to a certain extent this statement would be correct, but it may be worth while to discuss the conditions regulating the prices of options, and to see if we can determine some method of ascertaining at any rate the probable *minimum* value of a put-and-call for a certain given period.

In order to do this, let us first see what the giver for the call of a certain stock really does. He thinks, for example, that Brighton "A" stock is going to rise, but having, on previous occasions, found that the movement of this stock for some inscrutable reason had been diametrically opposed to the favourable opinion he had preconceived of it, he seeks to *insure himself against unlimited risk*, and is willing to pay an insurance premium for the convenience. Accordingly, he goes to an option dealer, who is willing to grant insurances against rises and falls, and says: "I wish

to speculate in Brighton 'A' for two months; if I buy £5000 stock, at what rate will you insure me against loss?" The option dealer replies: "I will take the risk of the rise *or* fall for 2¼%, or the risk of both for 4½%". Now what is it that suggests the figure of 4½% to the option dealer as a reasonable cover for the risk he is taking over? He must say to himself: "I do not think, judging from my experience, that the fluctuation of Brighton 'A' during the next two months will be more than 4½%. It has been much more at times but the market is dull now, 4½% is a good deal of money in hand, and I think the business is worth doing". He forms in his own mind an estimate of the probable movement of the stock during the next two months, and the result of his mental calculation is that he runs the risk of the rise and fall from the present market price of Brighton 'A' for a premium of 4½%. Had the proposition been Consols he would probably have asked about ⅞%, Erie Shares 2½%, Milwaukee Shares 5%—all on the same rough and ready principle. Now, is it not possible to ascertain by statistics a figure which should represent more accurately the "probable risk" run than one which has been determined, in the first place, by guess work, and in the second, by the *speculative impulse of the moment.*

The writer is of opinion that the risk can be ascertained with a considerable degree of accuracy; and in this belief he has selected some of the principal speculative stocks and traced their fluctuations from

week to week over a period of seven years from January, 1888, to December, 1894. The price of each week has been compared with those of the previous week, fortnight, month, two months, and three months (the fluctuations being carried out in columns), and averages have been taken over the whole period in question.

The stocks selected for the purpose are: Consols, Brighton 'A,' Spanish 4%, Rio Tinto Shares, De Beers Shares (since 1890, five years), and the following shares in the American market: Erie, Norfolk and Western, Union Pacific, Chicago, Milwaukee and St. Paul, and Louisville and Nashville.

During the seven years under review these ten representative stocks have been subject to every kind of influence, financial and political; they have seen times of utter stagnation, and times of the greatest activity; weak markets and strong markets; alternate periods of excessive optimism and desperate depression, and during the whole term they have moved up and down consistently with the spirit of the seasons through which they were passing, the fluctuations at one moment being rapid and violent, at another almost imperceptible. If, therefore, an average be ascertained of the fluctuations for given periods in the market prices of these representative stocks, would not that average form a fair basis upon which to calculate the expected performance of those particular stocks in the immediate future? In fact, does it not come to a question of insurance pure and simple, a premium

being asked to cover a risk ascertained by a kind of actuarial calculation? Very nearly, although there *is* a difference between this and other classes of insurance; were it not so, one could reduce Stock Exchange operations to a certainty, which is known, to borrow Euclid's expression, to be absurd. The difference lies partly in the fact that the statistics governing the premiums exacted for insurances upon life, fire, accident, etc., are obtained with greater accuracy from results spread over a much longer period than it would be possible, or even useful, to do in the case of stocks, and that the conditions from which those results follow are much more regular and reliable. Thus, a life insurance company knows that out of one thousand "healthy males" of thirty years of age, it can, with the greatest amount of certainty, expect eight or nine to disappear from the scene of its actuarial calculations before the age of thirty-one. In other words, the "cost of carrying the life" for one year of a man aged thirty, of robust health and good habits, is ascertained to be under £9 per £1000. Whatever the company can charge over and above this amount, plus the working expense, must be its profit, *always provided that it can do sufficient business to establish an average.* And it is precisely these last words that express the great difference existing between the insurance against fluctuation of stocks and most other classes of insurance. To calculate the value of a risk is one thing, but to make a profit by dealing on that basis is quite another. An individual might insure the life of

another to the extent of £1000 for £30 per annum (on the assumption that the actuarial risk was £15), and consider that he was making £15 a year by the transaction ; but if the insured dies in the first year there is a loss of £970 in spite of all actuarial reckoning. *He must "take the money" very many times to make it pay.*

It is just so with the taker of option money. Not only must he ascertain the average past behaviour of the stock he is about to deal in, but he must be careful that he can sell this risk a sufficient number of times during the year to establish the average upon which his premium is based.

Now, most people who are conversant with the nature of speculative transactions in stocks, and with options in particular, will know that owing to the fickle nature of givers of option money it is impossible to establish the average as suggested above. In actual practice, it is found by option dealers that, unlike other classes of insurers who are willing, *e.g.*, to insure their lives although they are in the best of health and spirits at the moment, or their houses in spite of their entertaining no immediate fear of being burnt out, the giver of option money only seeks protection when he considers that the option money paid does not anywhere nearly represent the risk of which he is relieving himself by passing it on to his taker. There is not that noble unselfishness about a buyer of a put or a call which is displayed by the man who insures his life only because "all men are mortal," and provision must be made for his little ones. Indeed, where would our

great life insurance companies be if they only received proposals from people who came in because they were not feeling very well? It amounts to this, that the greatest demand for options springs up at a time when it is least profitable for the taker to operate, when dealing against the option in the firm stock is fraught with the most serious danger and difficulty; and, per contra, just when the option taker has a chance of recouping his losses by "running the put-and-call" in a dull and inactive market, he finds that there are "*no givers*"! Then, it may be asked, how is it possible ever to find a taker of option money at anything like a reasonable rate? The answer is that the option dealer does not work upon any regular system or actuarial basis, but is guided in his operations mainly by the speculative impulse of the moment. This speculative impulse does not exist in any other description of insurance, and had it existed to any appreciable extent, the life of the great insurance corporations would be as extinct at the present moment as is the business of the majority of the great option dealers who have found by experience that it is the givers, and not the takers, of option money who have gained the advantage in the long run. A comparison of the table of the Average Fluctuations with lists of option quotations ruling in the market during past years will suffice to illustrate the argument that takers of option money have been carrying on an insurance business with no margin for profit and working expenses, even if they could rely on being able to take

the same amount of option money on the same quantity of stock all the year round and for many years in succession.

To lay down a distinct rule for the amount which, in order to provide a reasonable margin for profit and working expenses, it would be necessary to add in the shape of "loading" to the option values, as set out at the end of this chapter, would be extremely difficult; for the conditions of the markets vary so much that what might appear a liberal allowance at one time would be inadequate at another. It is safe to assert, however, that in order to carry an option-taking business to a successful issue it would be essential:—

Firstly, to ascertain the past average fluctuations over a considerable period of time of the stock to be operated in.

Secondly, to consider whether there is any special influence at work calculated to modify that average result in the immediate future (such as a particular scarcity of the stock for delivery, financial strain, or probability of political complications).

Thirdly, to accept risks on approximately the same amounts of stock at regular intervals of time.

Fourthly, to add to the "average value" of the put and call an amount which will give a fair margin of profit and allowance for working expenses.

Fifthly, to make provision for possible default on the part of the giver (since the option money only becomes payable at the *end* of the option period), and for special contingencies, such as large differences or

bad debts on option stock carried over—through buying one half of the stock to convert the call into a put-and-call—or loss through an unexpected rise in the money rate, none of these mischances being provided for in the "average value" tables, which have been calculated simply from the average fluctuations.

Sixthly and lastly.—To be careful that, having once accepted a risk, the option shall be allowed to run to the end of the option period without being tampered with by hedging operations in the firm stock or "cutting the loss" before its time, and that at the expiry of the option the profit or loss shall be taken as final and the position be absolutely closed.

Neglect of any of these conditions would completely spoil the average and convert a stocks insurance business into a mere gamble. Let us examine how far they have been observed in the quotations of options for two months and three months respectively in two of the leading speculative shares of the American railroad market—Milwaukee shares and Louisville and Nashville.

Taking the first-named stock we find that in 1888 fifty-two fluctuations of two months averaged 4·47°/₀; the same number of fluctuations in 1889 averaged 3·02°/₀; in 1890, 6·05°/₀; in 1891, 4·63°/₀; in 1892, 2·88°/₀; in 1893, 6·48°/₀; and in 1894, 4·29°/₀—showing a grand average over the seven years of 4·54°/₀.

The three months' fluctuations in the same stock come out as follows: In 1888, 4·20°/₀; in 1889, 3·16°/₀; in 1890, 8·11°/₀; in 1891, 6·70°/₀; in 1892, 2·90°/₀; in

1893, 7·02°/₀; in 1894, 5·40°/₀—giving a grand average in seven years of 5·29°/₀.

By the same process we find that the two months and three months' fluctuations of Louisville and Nashville shares were—

	Two Months.		Three Months.	
1888,	3·84°/₀		4·19°/₀	
1889,	5·43°/₀		8·02°/₀	
1890,	4·77°/₀	Average,	5·05°/₀	Average,
1891,	4·32°/₀	4·45°/₀.	4·59°/₀	5·34°/₀.
1892,	2·88°/₀		2·90°/₀	
1893,	5·41°/₀		7·28°/₀	
1894,	4·53°/₀		5·40°/₀	

Now, to put the argument into a practical form we will assume that it would have been possible for an individual or a company to take 4·45°/₀ for the put-and-call for two months of 1000 Louisville Shares once every week from 1st January, 1888, to 31st December, 1894; that it was not necessary, in order to do this, to take for the call of 2000 shares and buy 1000 shares, thereby indirectly increasing the risk and working expenses; that no bad debts were incurred by givers failing to pay up at the end of the time; that every transaction was closed at the expiry of the option, and that no unfortunate hedge against a dangerous-looking option was ever done during its currency. The taker would have had a running risk of 8000 shares against him, one option maturing every week and another taking its place; he would have dealt fifty-two times in 1000 shares in each year, and again fifty-two times

in 1000 shares in re-buying or re-selling to close his position; that is, in 104,000 shares (of $100 each), or in a total of 728,000 shares in the seven years, equal to a turnover (taking an average price of 60) of £8,750,000, with a result of *no profit*, many heartaches, and the whole of his working expenses to the debit of the account.

But suppose that an individual dealer could conduct an option business on the above scale at a working expense of £1300 per annum, inclusive of bad debts, and that, being a modest individual, he would be willing to run a permanent risk against himself of 8000 shares for about £5000 a year profit; finally, that he uses in his option business only an amount of capital sufficient to cover the loss on 8000 shares in the greatest two months' fluctuation in Louisville known during the last seven years (16½% in November, 1890), say £26,000; he would then have to charge for the option—

(1) The "average value," say - -	4½%
(2) Proportion of working cost £1300	⅛%
(3) Proportion of 5% interest on a capital of £26,000 - - -	⅛%
(4) Other contingencies - - -	⅛%
(5) Margin of profit - - -	½%
Total - - - -	5⅜%

Thus, by taking every week 5⅜ put-and-call of 1000 Louisville Shares for two months ahead, and closing the operation in each case at option time, a taker

would secure a profit in the average of $\$\frac{1}{2}$ per share, equal to £5200 on 52,000 shares. On the basis of $5\frac{1}{8}$ his profit would be £2600, and at $4\frac{7}{8}$ he would have paid his working expenses and the interest on his capital, but have no profit.

Now, to turn for one moment to fact, notice that :—

In the first week of January, 1895, *the two months' single options in Louisville and Nashville Shares, and Chicago Milwaukee and St. Paul Shares were quoted* $\$1\frac{7}{8}$, *equal to* $\$3\frac{3}{4}$ *for the put-and-call!*

The three months' single options of these two stocks on the same date were quoted respectively $\$2\frac{1}{4}$ and $\$2\frac{3}{8}$, equal to $\$4\frac{1}{2}$ put-and-call on Louisville and $\$4\frac{3}{4}$ on Milwaukee. The "average values" for three months come out 5·34% on Louisville and 5·29% on Milwaukee, and, treating these figures in the same manner as we have done in the case of the two months options, we find that, on the basis of $\$6\frac{1}{4}$, the option taker would have averaged a profit of $\$\frac{1}{2}$ per share during the seven years, 1888-1894, and that at the premium of $\$5\frac{3}{4}$ he would just have paid his expenses and interest on capital. At any lower premium he would have worked at a loss.

It is not the intention of the writer to illustrate any further the difference between the actual market prices of options and their "average values". The foregoing examples have been quoted with a view to suggesting further investigation on the part of the reader, and for the purpose of placing before him a method of examination which may make the study of

options and option dealing something better than dry business and dull figures. The appended table of average values is by no means complete, although it has been prepared, as far as it goes, with a considerable amount of care, and the main object of introducing it into this little volume is to offer a practical reply to those who have been heard to say: "If the option dealer thinks it good enough to take the money, it cannot be 'business' for me to give it".

TABLE OF AVERAGE VALUES.

The approximate value of the "put and call" of some leading stocks, as ascertained by the average fluctuations for the periods in question, between 1st January, 1888, and 31st December, 1894.

	Years.	One Week.	Average.	Two Weeks.	Average.	One Month.	Average.	Two Months.	Average.	Three Months.	Average.
CONSOLS.	1888	·25		·40		·67		·98		1·18	
	1889	·19		·29		·39		·58		·79	
	1890	·30		·49		·72		1·06		1·34	
	1891	·25		·36		·47		·64		·75	
	1892	·24		·32		·49		·79		1·10	
	1893	·23		·36		·56		·85		1·07	
	1894	·22	·24	·38	·37	·70	·57	1·17	·86	1·65	1 12
BRIGHTON "A".	1888	·91		1·39		2·01		3·69		5·65	
	1889	1·41		2·21		3·80		6·08		7·31	
	1890	1·26		2·09		2·97		3·46		4·00	
	1891	1·25		1·88		2·99		4·64		5·28	
	1892	1·06		1·60		2·71		4·75		6·40	
	1893	1·23		2·00		3·04		4·65		6·25	
	1894	1·16	1.18	1·69	1·83	2·87	2·90	3·92	4·45	4·73	5·66
SPANISH.	1888	·46		·74		1·14		1·97		2·88	
	1889	·50		·78		1·29		1·78		1·99	
	1890	·52		·80		1·20		1·74		2·05	
	1891	·75		1·08		1·63		2·25		2·63	
	1892	·82		1·22		1·93		2·85		3·19	
	1893	·61		1·00		1·63		2·13		2·24	
	1894	·59	·60	·87	·92	1·30	1·44	2·31	2·14	3·19	2·59
RIO TINTO.	1888	·62		·88		1·14		2·14		2·95	
	1889	·61		·96		1·69		3·02		3·93	
	1890	·50		·80		1·55		2·05		2·64	
	1891	·42		·60		·81		1·09		1·29	
	1892	·33		·51		·86		1·09		1·01	
	1893	·22		·37		·57		·83		1·06	
	1894	·28	·42	·38	·64	·60	1·03	·91	1·59	1·02	1·98
DE BEERS (five years only).	1888	...		...		...		...		...	
	1889	...		...		...		...		...	
	1890	·44		·59		·92		1·27		1·40	
	1891	·35		·50		·74		1·10		1·25	
	1892	·22		·37		·58		1·06		1·47	
	1893	·32		·47		·77		1·22		1·61	
	1894	·32	·33	·39	·46	·66	·73	1·07	1·18	1·26	1·39
ERIES.	1888	·72		·97		1·64		2·53		2·51	
	1889	·62		·70		·97		1·46		1·43	
	1890	·57		·97		1·56		2·36		2·88	
	1891	·93		1·24		1·97		3·10		3·85	
	1892	·90		1·25		1·63		2·07		2·22	
	1893	·90		1·32		1·89		2·73		3·22	
	1894	·56	·74	·83	1·04	1·43	1·58	2·06	2·33	2·37	2·64
MILWAUKEE.	1888	1·45		2·09		3·13		4·47		4·20	
	1889	1·27		1·56		2·44		3·02		3·16	
	1890	1·16		2·21		3·45		6·04		8·11	
	1891	1·28		1·81		2·74		4·63		6·70	
	1892	1·19		1·44		2·00		2·88		2·90	
	1893	1·95		2·94		4·22		6·48		7·02	
	1894	1·18	1·35	2·01	2·00	2·97	2·99	4·29	4·54	4·97	5·29
LOUISVILLE.	1888	1·10		1·55		2·60		3·84		4·19	
	1889	1·22		1·76		3·05		5·43		8·02	
	1890	1·25		2·04		3·13		4·77		5·05	
	1891	1·49		2·05		3·20		4·32		4·59	
	1892	1·19		1·44		2·00		2·88		2·90	
	1893	1·75		2·79		3·29		5·41		7·28	
	1894	·94	1·27	1·67	1·90	3·03	2·90	4·53	4·45	5·40	5·34
NORFOLK PREF.	1888	·92		1·33		2·31		3·19		3·60	
	1889	·78		1·22		1·96		3·01		3·63	
	1890	·84		1·45		2·19		3·16		3·21	
	1891	1·00		1·32		2·25		3·03		2·90	
	1892	·75		1·22		1·67		2·39		2·59	
	1893	·97		1·53		2·04		3·47		4·70	
	1894	·87	·87	1·36	1·34	2·11	2·07	2·78	3·00	3·10	3·39
UNION PACIFIC.	1888	1·18		1·63		2·13		2·87		3·48	
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	1890	1·18		1·97		3·01		4·73		6·17	
	1891	1·39		2·00		2·62		3·25		3·30	
	1892	·93		1·31		1·89		3·02		3·82	
	1893	1·38		2·11		3·09		4·37		4·92	
	1894	·79	1·13	1·34	1·68	2·11	2·40	2·94	3·44	3·23	4·03

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TRIANGLE.

Higgins's Patent Calculating Triangle

(AMERICAN PARITIES).

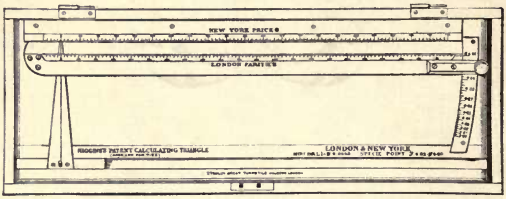

Fig 1.

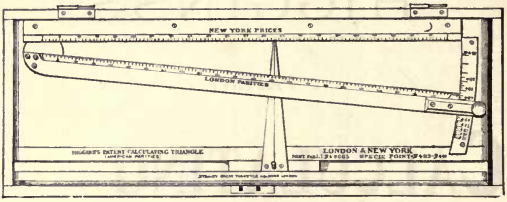

Fig 2.

THIS Instrument calculates instantaneously the English equivalents of New York prices at any rate of exchange between $4.80 and $4.90.

Figure 1 shows the two Scales fixed at the rate 4.90. Parities at any lower exchange can be read off by moving the indicator and cursor as shown in Figure 2.

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